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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,088	04/28/2005	Akio Koganei	03500.017996	2413

5514 7590 11/30/2006

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EXAMINER

SUCH, MATTHEW W

ART UNIT PAPER NUMBER

2891

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/533,088

Applicant(s)

KOGANEI ET AL.

Examiner

Matthew W. Such

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/28/05 & 9/8/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities:
 - i. All instances of the word "processings" should read "processing";
 - ii. The word "Almina" on page 30, line 18 should read "Alumina".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson ('572) in view of Smith ('551).

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5. Regarding claims 1-3, Jackson teaches an organic thin film transistor with a gate electrode (Element 14), a gate insulator film (Element 16), an organic semiconductor film (Elements 20, 22, 32), a source electrode (Element 18), and a drain electrode (Element 24). The average surface roughness of the gate electrode, which is in contact with the gate insulating film, is from 0.1-15 nm (Col. 4, Line 28; for example, $R_a = 1.0 \text{ nm peak} - 0 \text{ nm valley} / 2 = 5$ Angstroms average surface roughness). Jackson teaches a glass substrate and not an organic substrate, such as polyethylene terephthalate or polyimide.

Smith teaches organic thin film transistors with glass, polyethylene terephthalate or polyimide substrates (Para. 0023-0024). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an organic substrate such as polyethylene terephthalate or polyimide instead of glass since Smith teaches that these materials are functionally equivalent as substrates for organic thin film transistors (Para. 0023-0034). Smith further teaches that polymeric substrates have the additional advantage of being flexible allowing for roll processing, providing greater economy of scale in manufacturing (Para. 0024). It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

6. Regarding claims 4-6, Jackson teaches a method of manufacturing an organic thin film transistor with a gate electrode (Element 14), a gate insulator (Element 16), an organic

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semiconductor film (Elements 20, 22, 32), a source electrode (Element 18), and a drain electrode (Element 24). The gate electrode is planarized as shown in the Figures of Jackson. The gate electrode is formed on the surface of the substrate as shown in the Figures of Jackson. The gate insulator is formed on the planarized gate electrode as shown in the Figures of Jackson. The average surface roughness of the gate electrode, which is in contact with the gate insulating film, is from 0.1-15 nm (Col. 4, Line 28; for example, $Ra = 1.0 \text{ nm peak} - 0 \text{ nm valley} / 2 = 5$ Angstroms average surface roughness). Jackson teaches a glass substrate and not an organic substrate, such as polyethylene terephthalate or polyimide.

Smith teaches organic thin film transistors with glass, polyethylene terephthalate or polyimide substrates (Para. 0023-0024). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an organic substrate such as polyethylene terephthalate or polyimide instead of glass since Smith teaches that these materials are functionally equivalent as substrates for organic thin film transistors (Para. 0023-0034). Smith further teaches that polymeric substrates have the additional advantage of being flexible allowing for roll processing, providing greater economy of scale in manufacturing (Para. 0024). It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

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7. Regarding claim 7, Jackson further teaches that the planarized gate electrode is formed by sputtering (Col. 4, Lines 25-28).

8. Regarding claim 8, Jackson further teaches that the gate electrode is planarized as shown in the Figures. The manner in which the claim is written does not limit the method by which the gate electrode is planarized. Therefore, any gate electrode that is planar in any conceivable orientation has been "planarized" and meets the claim.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson ('572) in view of Smith ('551) as applied to claim 8 above, and further in view of Yu ('040).

Jackson in view of Smith does not teach convention methods of planarizing layers.

Yu teaches conventional CMP processes for polishing gate layers. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a CMP process in order to planarize the gate electrode. One would have been motivated to do so since Yu teaches that CMP is a conventional process for producing very smooth layers (Col. 2, Lines 50-55).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Noack ('267) teaches method of CMP and measuring surface roughness;

Hirari ('729) teaches organic thin film transistor configurations.

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Contact Information

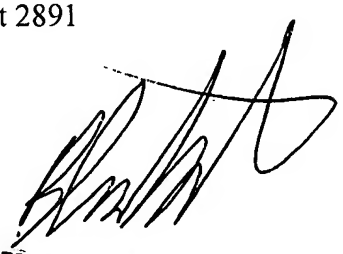
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew W. Such whose telephone number is 571-272-8895. The examiner can normally be reached on Monday - Friday 8AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew W. Such
Examiner
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MWS
11/20/06



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